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New R&D Budget: A Boost but No Bonanza

The budget that President Carter sent to Congress on January 23 is not going to buy research and development out of the financial doldrums that have afflicted it since the turn of the decade.

Though described by Science Adviser Frank Press as bearing "the imprint of the President's personal interest in the vitality of the Nation's science and technology," the budget, while moderately generous toward *basic* research, adds up to a standstill in federal financial support for the nation's overall research and development enterprise.

For the R&D community, then, including basic research, the net effect will not be any significant relief from the financial stringencies of recent years, regardless of the euphoric rhetoric that accompanied the unveiling of the budget. Let's look at the budget in broad outline, and then we can examine some of the finer points:

First, though, we'll make it easier for all of us by glossing over the distinction between "obligations" and

Excerpts from Science Adviser's R&D Budget Briefing --- Page 3

"outlays." The former refers to money committed but not necessarily spent in a given fiscal year, while the latter refers to actual spending in that year. The figures diverge, but for our purposes, they're usually close enough so as to justify use of one or the other for purposes of convenience.

Presented as Mr. Carter's plan for Fiscal 1979, which commences next October 1, the overall budget calls for increasing federal spending by 8 per cent, to a total of $500 billion. What this more or less means — in the aggregate — is a very slight increase in the scale of federal activities, since the inflation rate is forecast at 6 per cent.

Confining our attention to the R&D portion of the budget, we find that the FY '79 plan calls for an increase of 6.1 per cent, to a total of $27.9 billion. Stack that up against the inflationary factor, and R&D gets near-zero growth.

Basic research, however, is scheduled to fare better than its neighbors in the overall R&D community, Congress willing. Its funding is slated to rise by 10.9 per cent, to a total of $3.6 billion. The increase, 5 per cent in terms of purchasing power, is indeed a rarity in an otherwise skimpy federal budget, and thus accounts for Press's Office of Science and Technology Policy (OSTP) putting out an announcement that leads off with "The Fiscal Year 1979 Federal obligations for research and development will support real growth in basic research." To which was added, that "Dr. Press emphasized that the new budget backs up the Administration's interest in strengthening the Nation's scientific capabilities. The revitalization of these capabilities will, in turn, have their effects on our abilities to meet new economic challenges, as well as those involving resource and environmental demands."

Now, while that's all probably true, the fact of the matter is that the budget is another of those many matters in which there's less than meets the eye.

The decision to keep basic research spending above the inflationary rate dates back to the Ford Administration, which accepted the argument that skimpy Nixon budgets and inflation had eroded the purchasing power of basic research to the point where it had sunk back to the levels of the late 1960s.

A few sage critics, notably on the House Appropria-

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In Brief

By a 6-5 vote, with one abstention, the council of the American Astronomical Society has decided to confine its meetings to states that have ratified the Equal Rights Amendment. Margaret Burbidge, the first woman president of the 77-year-old, 3400-member society, said all meetings, starting in 1980, will be held in "enlightened states." As it turns out, meetings scheduled prior to that date are in states that have already ratified the measure.

"Whistle-Blowing and Scientific Responsibility: The Management of Scientific Dissent," will be the subject of two three-hour sessions February 15, at the annual meeting of the American Association for the Advancement of Science, in Washington. The sessions will focus on the experiences of employees of the Food and Drug Administration and the Nuclear Regulatory Agency.

The Department of Energy is evaluating 1120 proposals submitted to its pilot program in Appropriate Energy Technology. With a total of $500,000 available, the program is designed to support research on "small-scale, decentralized energy programs that use local, renewable resources."

. . . Defense Research Takes Lion's Share

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tions Committee, responded with skepticism over whether that space-inflated era is a suitable benchmark for making basic research budgets. But, in any case, the leadership of the scientific community now regularly contends that the national research enterprise has shrunk from previous levels. And, while the two Ford budgets and now Carter's budget represent a positive fiscal response, the supplements are pretty small in terms of the situation that's been depicted by the statesmen of science.

Furthermore, the academic community ought to note carefully that the President who came to office on pledges of reducing the girth of the military establishment is proposing in his first budget to give the military a substantially increased role in the national research effort. Though Carter the candidate did not specifically address himself to the relative role of military research, the figures do not harmonize with the impression that he carefully created.

Thus, defense-related R&D is budgeted to rise from $12.7 billion to $13.8 billion, an increase of 8.4 per cent, including a 14 per cent jump in basic research. Meanwhile so-called civilian research gets an increase of 2.4 per cent — a mere $225 million over the present total of $10.7 billion.

The explanation, as presented by OSTP, is that "The slowdown of growth in this category of R&D is the result primarily of decisions to cut back on certain development and demonstration programs where user demand or future economic viability and institutional acceptance were deemed highly unlikely. The new budget," the explanation continues, "emphasizes investment in longer-term research for future and new technology options, rather than commercial-scale (and relatively higher cost) demonstrations."

Specifically, this means shifting of funds from such costly items as the Clinch River Liquid-Metal Fast-Breeder Reactor demonstration project, and, presumably, their reassignment to other activities.

Assuming that the budget gets through Congress essentially intact, the big question for the scientific community is whether it represents a reasonable re-

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FEDERAL FUNDING FOR CONDUCT OF R&D BY AGENCY
(MILLIONS OF DOLLARS)

DEPARTMENT OR AGENCY	OBLIGATIONS FY 1978	OBLIGATIONS FY 1979 ESTIMATE	OUTLAYS FY 1978 ESTIMATE	OUTLAYS FY 1979 ESTIMATE
TOTAL	26,289	27,890	24,854	26,984
DOD — MILITARY FUNCTIONS	11,709	12,740	11,137	12,315
DOE	4,231	4,245	3,881	4,188
NASA	3,877	4,193	3,824	4,090
HEW	3,137	3,258	2,890	3,141
NSF	754	829	715	764
USDA	626	632	604	582
EPA	351	358	330	345
DOT	364	342	342	335
INTERIOR	366	340	335	342
COMMERCE	288	316	270	298
ALL OTHER	587	637	527	587

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Editor and Publisher
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Major Excerpts from Frank Press Briefing

Public presentation of the President's budget is preceeded by news briefings on special segments of it. The following excerpts are from the R&D briefing, January 21, by presidential Science Adviser Frank Press, who is director of the Office of Science and Technology Policy (OSTP). With him were Gilbert Omenn and Philip Smith, assistant directors of OSTP, and Hugh Loweth, head of the Division of Energy and Science, Office of Management and Budget, and Douglas Pewitt, OMB energy specialist.

Press: Let me begin by telling you something of the process we use in working up the Federal R&D Budget.

As you know, it is an aggregation of the separate R&D budgets, of the individual departments and agencies.

So the key element in that is the individual reviews and discussions of the departmental budgets. Nonetheless, the FY'79 budget is unique because of the special awareness of the President concerning R&D issues and his personal interest and involvement.

In the spring, the President asked OSTP and OMB to examine the overall basic research issues, across all departments and agencies in government. We did so in a number of ways.

Working together, we talked to a large number of people, large numbers of industrial R&D managers, university presidents, heads of laboratories across the country, experts on such issues as the health of American science and so on.

The President also asked if we would involve those Cabinet Secretaries with large R&D budgets in this process and Secretaries Califano [HEW], Brown [Defense] and Schlesinger [Energy] played an important role.

The heads of the independent agencies, like Dr. Fletcher of NASA, were involved. The Vice President played a role. He has a deep interest in this area. At one of the Cabinet meetings, the President turned to the Secretaries and ask them to submit a list of research questions that were important to them in carrying out their missions.

So this was a top-level government-wide analysis that we made in involving the R&D budget.

US Science in "Good Condition"

. . . . essentially we found mainly that US science was in good condition, but there were areas of concern, particularly involving opportunities for young scientists, growing obsolescence of equipment in some of the foremost research centers, more conservative research proposals as reported to us by program managers, and an apparent — what somebody perceived as a reduction in the number of first-class research centers in the country.

The President accepted our recommendations, and approved a real growth in basic research supported by the Federal Government for this budget, with special emphasis on those mission agencies which had in recent years under-prioritized basic research.

You might call this a tilt toward basic research in this budget. . . .

Shortly after taking office I determined that investment in basic research on the part of the Federal Government had fallen far too low over the past decade.

Accordingly, I directed a careful review be undertaken for the appropriate basic research opportunities. As a result of that review the budget proposals are real, a rate of growth of almost 5 per cent above inflation for the FY '79 budget.

Another issue that came up in our study involves the balance between basic research, applied research and development. There is no question, nobody debates the fact in government, that the federal role in supporting basic research is a correct role, important in developing new technological options for the nation, an area that business underinvests in, and for legitimate reasons, be-

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BUDGET

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sponse to problems of the moment and those that lie ahead.

The answer would seem to be that the Carter Administration has more good intentions than money at its disposal, but given the fiscal realities of the moment, has tried to do right by R&D. The problem of budgeting for research is always difficult, since no amount can ever be enough.

But, as noted in the last issue, the Carter Administration has made a good deal of progress in the direction of viewing the federal R&D effort as a whole — rather than as an agency-by-agency enterprise. In terms of politics, that's a messy way to do it, as evidenced by the nasty fight last year over the Clinch River project. Nevertheless, the intent is sound, as is the effort to continue with catchup efforts for the financing of basic research.

The budget provides no bonanza for basic research — and it's far short of that for applied and developmental research. But all things considered, it's not bad. —DSG

. . . Slower Growth for Some R&D Categories

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cause the payoff is too far in the future, and the output is more socially useful than for the individual companies.

The federal role in development and demonstration is a more difficult one to evaluate. And this year we reviewed demonstration projects, and raised the following kind of questions: Is it more appropriate for the private sector in developing and marketing new products?

Do the projects represent a major technological jump forward? Is there user demand or future economic viability of this particular demonstration project?

Are we doing this thing over and over in multiple demonstration plants with minor differences between them?

"Hard Look" At Demonstrations

There are other mechanisms to put these forward, in the sense of tax credits and other incentives and so on. In making these evaluations and these assessments you will find as we show the figures, that we took a very hard look at demonstration plants, and we support as many of them as are put forward. . . .

In basic research, the overall increase for R&D is 6.1 per cent. The basic research increase is . . . $3.6 billion, an 11 per cent increase in obligations and 13 percent increase in outlays for '79.

You see slower rates of growths in the area of applied research and development. . .The defense obligations shows an increase of 8.7 per cent. The civilian R&D goes up by 3 per cent, space, 6.3 per cent.

In the defense area, there are a lot of transfers from R&D to production . . . In the civilian sector I don't have to remind you that energy R&D represents the largest component in civilian R&D.

The Clinch River cancellation, the shift from successful programs in solar demonstration to commercialization by a rapidly growing industry, is a big factor there. . .

The Department of Energy budget in R&D is almost constant, an increase of 3/10 per cent.

That is mostly due to the decreased emphasis on demonstration, but within that budget, nuclear research and applications, such as advanced reactors and breeders, are up 22 per cent.

Geothermal is up 23 per cent, solar electric up 23 percent. Conservation technology and applications up 27 per cent. Basic energy sciences, and advanced technology, up 26 per cent. Biomass research up 28 per cent. Fusion up 18 per cent.

Space Spending

Lest you think that demonstrations have been cut back, I should remind you that the solvent refined coal demonstration plant is going ahead. There are high Btu gasification, low Btu gasification demonstration plants, major construction in the fast-flux test facility, major expansion in the uranium assessment program.

The NASA budget represents an increase in R&D,

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FEDERAL FUNDING FOR CONDUCT OF BASIC RESEARCH BY MAJOR AGENCIES

(MILLIONS OF DOLLARS)

DEPARTMENT OR AGENCY	OBLIGATIONS FY 1978 ESTIMATE	OBLIGATIONS FY 1979 ESTIMATE	OUTLAYS FY 1978 ESTIMATE	OUTLAYS FY 1979 ESTIMATE
TOTAL	3,288	3,647	3,143	3,462
HEW	863	992	819	946
(NIH)	(763)	(856)	(725)	(827)
NSF	688	755	653	696
NASA	468	520	474	516
ENERGY	433	468	417	458
DOD — MILITARY FUNCTIONS	321	364	293	338
AGRICULTURE	245	262	228	228
INTERIOR	158	164	156	161
SMITHSONIAN	31	33	31	33
COMMERCE	27	31	27	31
EPA	20	28	16	25
ALL OTHER	35	31	28	30

. . . Some Relief Targeted for Universities

(Continued From Page 4)

that is, total NASA budget, of 8.2 per cent. Within the NASA budget, space science is going up 22 per cent, space applications up 17 per cent, space research and technology up 10 per cent, aeronautics research and technology up 16 per cent.

Basic research, at NASA, up 11 per cent.

HEW, overall R&D up close to four per cent. Within that budget, basic research is up 15 per cent, a shift toward the basic sciences. . . .

The Environmental Protection Agency . . . shows a modest increase of two per cent, but if you make a cross-cut over the whole government, in the category of understanding, describing and predicting the environment, there is a 12½ per cent increase. . . .

The earthquake thrust that was started last year, earthquake hazard mitigation . . . has essentially the same budget at the Department of Interior, where they received a 161 per cent increase in their research, earthquake research budget.

Bureau of Standards, research and development budget is up 20 per cent and NOAA, 9.3 per cent.

This is the basic research budget by major agencies. As I mentioned before, the total increase is 11 per cent across government. Fifteen per cent at HEW, 9.7 at NSF, 11 per cent at NASA, 8 per cent at the Department of Energy, 13.4 per cent in the Department of Defense, close to 15 per cent in Commerce. . . .

Funds For Universities

In the overall, of course, the universities and colleges will benefit, because they do basically two-thirds of the federally funded [basic] research. They will benefit from the 11 per cent increase in the basic research category. . .

This growth is intended not only to encourage scientists to undertake innovative research, but also to assist in ameliorating some of the projects currently associated with the performance of research in colleges and universities, including the growing obsolescence of equipment and the lack of opportunities for new investigators. . . .

There is a special effort this year in the climate area. After an analysis of climate issues, an interagency review, which took almost the entire year, and also, I might mention that this is an area of great concern to the Congress, it was decided to establish a lead agency for climate research, which would coordinate all of the climate research in a half dozen or so different departments in the Federal Government, and to initiate this, [there] was a 38 percent increase in the climate budget, climate research budget. . . . The Department of Commerce is the lead agency, and NOAA within the Department of Commerce, will establish the climate office. . . .

Question: Dr. Press, what was the suggestion that OSTP made about total, what you and your colleagues wanted for total outlays? It is now $27 billion for R&D. What did you suggest to OMB that that number be?

Press: We don't do the budget that way . . . suggesting a total. The process is to work with each agency and see what it submits for R&D in order to meet its authorized mission. And the aggregate comes out, whatever it comes out, after this process.

In the basic research area, we worked that somewhat differently. We wrote to the agencies, that is the Director of OMB wrote to the agencies and asked them to make a special study of how basic research has fared in recent years in their agency, and we submitted proposals for overall increase in the basic research area.

Question: What was that, sir?

Press: It was between four and five percent. We left it floating and let that come out just on the basis of the individual submission. . . Assuming six per cent or so inflation. So that was between 10 and 11 per cent increase that we recommended.

Question: In other words, you got what you recommended?

Press: Yes. That wasn't our own recommenda-

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Drop in Facilities Funds

In a rare statement on the internal needs of the scientific community, President Carter last fall expressed concern about a decline in the quality of scientific instruments, the job shortage for young scientists, and a decline in the "number of top-ranked research centers" (SGR Vol. VII, No. 20).

How, if at all, does his recently released budget seek to remedy these problems, such as they may be?

The answer is that the President's budget does not reflect the President's statement of concern. While it may be, as a presidential budget analysis indicates, that all three problems are supposed to benefit from the overall spending increase planned for basic research, specifics are hard to find. Furthermore, it's interesting to note one particular item in the budget analysis, under the heading of "Facilities":

"Obligations for the construction or renovation of facilities, and for the acquisition of major items of equipment used to conduct R&D, will *decrease* (italics supplied) by about $327 million to about $1.3 billion in 1979."

. . . Fast-Breeder Program Cut by $150 Million

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tion — OMB and OSTP were 100 per cent in agreement on all of this.

Question: In September the President said he had decided on his basic [research] policy and he was directing you and the OMB to look over the budget request . . . to see if basic research was underfunded, in your opinion. Could you give us some examples of some agencies where you actually suggested that the Department increase the budget request for research?

Press: I don't know that I want to do that in terms of individual agencies. . . .

Question: . . . is there a cutback now in the number of shuttle orbiters? Secondly, can you talk a little bit about how much money you got out of the Clinch River curtailment effort, and where it went?

Press: In the FY '79 budget, the President is proposing the development of four shuttle orbiters.

If, because of accidental loss or because of unanticipated greater use, a case can be made a few years from now for a fifth one, that option is left open.

In terms of Clinch River —

Pewitt: The LMFBR breeder program has been reduced by $150 million below the 1978 level, in keeping with the redirection of this program.

VA Research

Question: You have been emphasizing basic research but I noticed in the Veterans Administration budget there's about a $447 [thousand] reduction in the basic research, for research carried on by VA scientists. Does this represent any change in direction, to get the VA out of basic research?. . .

Omenn: The VA was not subject to any intensive review in our office. It was a result of their own priorities and negotiation and reflects in part the excellent results of research through the VA system including two Nobel Prizes this year in physiology and medicine and the success of some of their researchers in obtaining funds through NIH and NSF on a competitive basis. . . .

Question: Did I understand you to say as a part of VA's excellent performance you cut down the research?

Omenn: We haven't done anything.

Industrial Research

Question: Dr. Press, there would seem to be an implied criticism of industry for failing to carry out more research and development in the President's budget materials. . . .[would] you could comment about that and how you feel about whether industry is doing enough research today?

Press: . . . I did mention that industry does tend to invest in basic research. That's not a criticism. That's a statement that simply was one of understanding the fact that they can't afford major exploratory basic research budgets because the payback takes 10 or 20 years. They can't pattern the results of this research . . . they can't keep it a secret and it's useful not [only] to themselves but to the competitors and whole country.

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FEDERAL R&D FUNDING TO UNIVERSITIES AND COLLEGES

(MILLIONS OF DOLLARS)

	OBLIGATIONS		OUTLAYS	
DEPARTMENT OR AGENCY	FY 1978 ESTIMATE	FY 1979 ESTIMATE	FY 1978 ESTIMATE	FY 1979 ESTIMATE
TOTAL	3,300	3,561	3,061	3,339
HEW	1,715	1,806	1,561	1,739
(NIH)	(1,491)	(1,571)	(1,369)	(1,518)
NSF	560	608	533	566
DOD — MILITARY FUNCTIONS	345	384	331	362
ENERGY	206	230	200	225
AGRICULTURE	178	197	168	170
NASA	128	128	115	115
STATE (AID)	25	53	15	25
COMMERCE	32	36	32	33
INTERIOR	33	34	32	33
EPA	30	33	31	32
DOT	20	21	19	21
ALL OTHER	29	31	26	29

NIH: Little Growth But Big Policy Shifts

The research budget of the National Institutes of Health shows relatively little change in plans for Fiscal '79 — an increase of $78 million in a current budget of $2.776 billion.

But within those grand totals, there are a number of significant shifts that reflect major policy changes in the Bethesda, Md., headquarters of American biomedical research.

Thus, the National Cancer Institute and the National Heart, Lung, and Blood Institute — the two fiscal giants of the NIH complex — are scheduled for token increases, $6 million and $7 million, respectively; with the inflation rate reckoned at 6 per cent, that means they're slipping back, which, in turn means, that the cancer and heart lobbies will be scaling Capitol Hill in full force, seeking friends to reverse the Administration's parsimony.

The big winner in research funds at NIH is the National Institute of Child Health and Human Development, for which the Administration proposes a $33-million boost in a budget that now totals $166 million — a 20 per cent increase. Most of these funds are intended for new programs in contraceptive development — an outcome of the Administration's opposition to most federally assisted abortion services — as well programs in fetal research and smoking prevention.

The other institutes at NIH will meanwhile share in budget increases totaling $32 million.

Overall, however, basic research at NIH will be boosted by $94 million, with the increase coming partially from the aforementioned new funds plus reprogramming of funds previously allocated to clinical research.

The budget will provide a revealing test for biomedical lobbying strength. Just prior to its release, Washington was treated to a lobbying blitz by a collection of medical and scientific luminaries that made the rounds of Congressional and Administrative offices to plead for additional research funds. Congressional figures listened attentively to their arguments, and Rep. Paul Rogers (D-Fla.), the key House figure in NIH legislative matters, said he was impressed and would seek additional funds for the agency.

In a tight budget year, however, and with Congress on a strict schedule under the Budget Act of 1974, the opportunities for exceeding the President's budget limits are considerably reduced.

BUDGET BRIEFING

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So one understands a more natural federal role here than is the case for industry. In terms of industrial investment in research and development, that's a very complex question and one has to do that sector by sector. In the high technology areas like computers, microelectronics, the investments in both basic and applied research are very high and very good and the companies get something out of it.

They contribute perhaps as [much] any to our balance of payments and to new employment in the country. On other sectors, the middle and lower technology, the R&D investment might not be as high as they have been historically, although in the past two years there has been a turnaround in industrial R&D investment.

But even there one has to dig deeper and see just how that industrial R&D funding, private funding, is being spent. In many sectors, it's not being spent on new technologies or new products but reinforcing old projects. These are questions which are extremely important to the country, for the simple reason that we enjoy our affluence, we enjoy our national security because of the technological strength of American industry.

We are going to undertake this coming year kinds of studies which can raise the kinds of questions which will enable us to answer better what has been happening, what has been the recent history of industrial investment in R&D and what is the federal role in such investments if they turn out to be necessary. . . .

Question: Can you give us an overall explanation . . . for why the largest overall increase [is] in more defense, overall as well as [in] the basic research figure?. . . .

Press: If there is anything this nation is good at, it is the high-technology approach to defense. It is the one thing we do in the whole world, the thing we do best. It was the assessment of the Secretary [of Defense] that, in the preparation of his budget and the submission, that this was something that was important, that it was under-funded perhaps in the years past.

If you notice the basic research increase in the Department of Defense, it is almost 14 percent. Secretary Brown and Undersecretary Perry, who runs R&D in the Defense Department, in looking over the history, past five or more years in the Defense Department, simply reached the conclusion that the Defense Department was endangering its own mission over the next decade because of under-investment in previous years. They want to reestablish connections with the basic research community, they want to reestablish connections with the research communities, in universities which in recent years have been severed. This thrust is moving in that direction. . . .

NSF Gets Small Share of Basic Research Growth

One of the more important policy aspects of the Carter Administration's first budget is that its proposed boost in basic research spending is dispersed among a number of government agencies and provides only a minor increase for the National Science Foundation.

While basic research spending throughout the federal government is scheduled to increase by $319 million, to a total of $3.462 billion, NSF's own budget would go up by only $76 million, which would bring it to $940.9 million.

The allocation is significant because it represents a departure from the so-called balance-wheel theory, which holds — if only informally — that NSF's task is to assure the well-being of basic research by providing funds for activities that are neglected by other agencies. Though more of a wish than a policy, the balance-wheel idea has had a lot of practical application, as when NSF took over a number of research activities dropped by the Department of Defense after the Mansfield Amendment restricted DoD to defense-related research.

Measured by percentage changes, the NSF budget is up 8.8, while its basic research component — which takes up 91 per cent of NSF's total spending — will increase by 9.7 per cent. This puts it considerably behind the 14 per cent basic research boost planned for DoD.

In its major categories, the NSF budget is as follows:

BUDGET ACTIVITY	ACTUAL FY 1977	CURRENT PLAN FY 1978	BUDGET REQUEST FY 1979	% INCREASE
MATHEMATICAL AND PHYSICAL SCIENCES AND ENGINEERING	224.4	246.0	268.3	9.1
ASTRONOMICAL, ATMOSPHERIC, EARTH, AND OCEAN SCIENCES	188.2	210.1	227.3	8.2
U.S. ANTARCTIC PROGRAM	45.3	48.2	50.7	5.1
BIOLOGICAL, BEHAVIORAL, & SOCIAL SCIENCES	126.6	142.2	158.0	11.1
BASIC RESEARCH STABILITY GRANTS	-0-	4.5	-0-	—
APPLIED SCIENCE AND RESEARCH APPLICATIONS	62.4	57.9	73.9[2]	27.6
SCIENTIFIC, TECHNOLOGICAL & INTERNATIONAL AFFAIRS	20.7	24.6[1]	24.3	-1.0
SCIENCE EDUCATION ACTIVITIES	74.3	74.0[3]	77.6	4.9
PROGRAM DEVELOPMENT AND MANAGEMENT	45.5	52.0	54.8	5.4
SUBTOTAL	787.4	859.5	934.9	8.8
SPECIAL FOREIGN CURRENCY PROGRAM	4.4	5.4	6.0	10.4
TOTAL, NSF	791.8	864.9	940.9	8.8

[1]Includes $2.2 million in unobligated funds carried over from FY 1977 commitments
[2]Includes $6.9 million in funds deferred from FY 1978
[3]Includes $0.8 million in funds carried over from FY 1977

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